Amendments to the Claims:

Claims 1, 15, 19, 20, 25, 29 and 33 are amended, claims 6 and 16 are canceled, and new claims 36 and 37 are added. This listing of claims will replace all prior versions, and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) A method of reconstructing optical tissues of an eye, the method comprising:

transmitting an image through the optical tissues of the eye;

measuring surface gradients from the transmitted image across the optical tissues of the eye; ~~and~~

applying a Fourier transform algorithm to the surface gradients to reconstruct a surface that corresponds to the optical tissues of the eye**; and**

adding a mean gradient field to remove a tilt from the reconstructed surface.

2. (Previously Presented) The method of claim 1 comprising aligning the reconstructed surface of the optical tissues of the eye with an image of the eye that was obtained during the measuring of the surface gradients.

3. (Previously Presented) The method of claim 1 or 2 comprising computing a correction ablation pattern based on the optical tissues of the eye as indicated by the Fourier reconstructed surface.

4. (Previously Presented) The method of claim 3 wherein computing a correction ablation pattern comprises deriving a proposed change in elevations of the optical tissue so as to effect a desired change in optical properties of the eye.

5. (Previously Presented) The method of claim 4 further comprising modifying the optical tissue surface according to the correction ablation pattern by laser ablation.

6. (Canceled)

7. (Previously Presented) The method of claim 1 wherein measuring the surface gradients comprises uniformly sampling the transmitted image over an aperture.

8. (Previously Presented) The method of claim 7 wherein the aperture is a pupil of the eye.

9. (Previously Presented) The method of claim 1 wherein measuring surface gradient data is carried out with a Hartmann-Shack sensor assembly.

10. (Previously Presented) The method of claim 1 wherein the surface is a wavefront surface.

11. (Previously Presented) The method of claim 1 wherein applying a Fourier transformation comprises applying a discrete Fourier decomposition and an inverse discrete Fourier transform.

12. (Previously Presented) The method of claim 1 wherein the Fourier transformation uses all of the available information in the reconstruction.

13. (Previously Presented) The method of claim 1 wherein applying the Fourier transform calculates a tomographic wavefront error map of the optical tissues of the eye.

14. (Previously Presented) The method of claim 1 wherein the image is transmitted by the optical tissues as a plurality of beamlets, wherein the surface gradients comprise an array of gradients,

wherein each gradient corresponds to an associated portion of the optical tissues of the eye, wherein each beamlet is transmitted through the optical tissues according to the corresponding gradient.

15. (Currently Amended) A method for measuring optical tissues of an eye, the method comprising:

transmitting an image through the optical tissues;

determining local gradients across the optical tissues from the transmitted image; ~~**and**~~

mapping a wavefront error of the eye by applying a Fourier transform algorithm to the surface gradients across the optical tissues of the eye**, and**

adding a mean gradient field to the wavefront error to correct for tilt.

16. (Canceled)

17. (Previously Presented) The method of claim 15 wherein determining local gradients across the optical tissues is carried out by a Hartmann-Shack sensor assembly.

18. (Previously Presented) The method of claim 15 comprising creating a laser ablation treatment table based on the mapped wavefront error of the optical tissues of the eye.

19. (Currently Amended) The method of claim 18 comprising modifying the optical tissue surface according to the **laser ablation treatment table** ~~**correction ablation pattern**~~ by laser ablation.

20. (Currently Amended) A system for measuring a wavefront error of optical tissue, the system comprising:

a processor;

a memory coupled to the processor, the memory configured to store a plurality of code modules for execution by the processor, the plurality of code modules comprising:

a module for transmitting an image through the optical tissues;

a module for determining local gradients across the optical tissues from the transmitted image; ~~**and**~~

a module for mapping a wavefront error of the eye by applying a Fourier transform algorithm to the surface gradients across the optical tissues of the eye**; and**

a module for adding a mean gradient field to the wavefront error to correct for tilt.

21. (Previously Presented) The system of claim 20 further comprising an image source coupled to the processor for transmitting a source image through the optical tissues of the eye.

22. (Previously Presented) The system of claim 20 further comprising a wavefront sensor system coupled to the processor.

23. (Previously Presented) The system of claim 22 wherein the wavefront sensor system comprises a Hartmann-Shack sensor assembly.

24. (Previously Presented) The system of claim 20 wherein the code modules further comprise a module for computing a correction ablation pattern based on the optical tissues of the eye as indicated by the Fourier reconstructed surface.

25. (Currently Amended) **The system of claim 24, further comprising a laser system that** ~~A laser system that is in communication with the system of claim 24 wherein the laser system~~ comprises a laser that is programmable to deliver a laser energy to the optical tissues according to the correction ablation pattern.

26. (Previously Presented) The system of claim 20 further comprising a camera to track the position of the optical tissues,

wherein the code modules further comprise a module for registering the wavefront error relative to the optical tissues.

27. (Previously Presented) The system of claim 20 further comprising an adaptive optical element that is coupled to the processor.

28. (Previously Presented) The system of claim 27 wherein the adaptive optical element is a deformable mirror.

29. (Currently Amended) A computer program stored on a computer-readable storage medium for measuring optical tissues, the computer program comprising:

code for transmitting an image through the optical tissues of the eye;

code for measuring surface gradients from the transmitted image across the optical tissues of the eye; ~~**and**~~

code for mapping a wavefront error of the eye by applying a Fourier transform algorithm to the surface gradients across the optical tissues of the eye<u>**; and**</u>

<u>**code for adding a mean gradient field to the wavefront error to correct for tilt**</u>.

30. (Previously Presented) The computer program of claim 29 further comprising code for computing a correction ablation pattern based on the optical tissues of the eye as indicated by the Fourier reconstructed surface.

31. (Previously Presented) The computer program of claim 30 further comprising code for delivering a laser energy to the optical tissues according to the correction ablation pattern.

32. (Previously Presented) The computer program of claim 29 further comprising code for aligning the mapped wavefront error with an image of the optical tissues of the eye.

33. (Currently Amended) A system for measuring optical tissues of an eye, the method comprising:

means for transmitting an image through the optical tissues;

means for determining local gradients across the optical tissues from the transmitted image; ~~**and**~~

means for mapping a wavefront error of the eye by applying a Fourier transform to the surface gradients across the optical tissues of the eye**; and**

means for adding a mean gradient field to the wavefront error to correct for tilt.

34. (Previously Presented) The system of claim 33 further comprising means for computing a correction ablation pattern based on the optical tissues of the eye as indicated by the Fourier reconstructed surface.

35. (Previously Presented) The system of claim 34 further comprising means for modifying the optical tissue surface according to the correction ablation pattern by laser ablation.

36. (New) A method of reconstructing optical tissues of an eye, the method comprising:

transmitting an image through the optical tissues of the eye;

measuring surface gradients from the transmitted image across the optical tissues of the eye;

adjusting the surface gradients; and

applying a Fourier transform algorithm to the surface gradients to reconstruct a surface that corresponds to the optical tissues of the eye;

wherein adjusting the surface gradients corrects a tilt of the reconstructed surface.

37. (New) The method of claim 36, wherein adjusting the surface gradients comprises subtracting an average gradient from the surface gradients.